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Notes on the ferns of the Champlain Valley

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Three years ago, during the summer of 1911, I spent six weeks botanizing in the Champlain Valley of Vermont, collecting not only pteridophytes, but phanerogams as well. Although records of the more important species have already been published in *Rhodora* (XV. 158-163, 200-201 (1913); XVI. 38-41 (1914)), my friend, Mr. Harold G. Rugg, has suggested that notes on the fernworts collected might prove of interest to readers of the *JOURNAL*. In the following notes I have accordingly included records of all the species collected, rare or common. My first month, from July to mid-August, was spent at Essex Junction, a railroad junction near Burlington, of some local fame as the scene of frequent railway accidents, and the rest of the time at Swanton, a small town about four miles below the Canadian border. Both towns are situated on large sandy deltas formed in glacial and slightly post-glacial times by the Winooski and Mississquoi Rivers, and deposits of limestone or marble with their characteristic species occur in both localities.

A number of ferns, common enough at both places as they are nearly everywhere in the East, may be dismissed with a mere listing of their names. These are *Adiantum pedatum*, *Dryopteris cristata*, *D. marginalis*, *D. spinulosa*, *D. spinulosa* var. *intermedia*, *D. Thelypteris*, *Asplenium filix-femina*, *A. Trichomanes*, *Cystopteris fragilis*, *Onoclea sensibilis*, *O. Struthiopteris*, *Polypodium vulgare* (collected at 4000 ft. on Mt. Mansfield), *Polystichum acrostichoides*, *Pteris aquilina*, *Woodsia ilvensis*, *Osmunda Claytoniana*, and *O. regalis*. *Dryopteris Boottii*, *D. cristata* var. *Clintoniana*, and the splendid *D. Goldiana* were found once or twice at both localities. On a rich wooded hillside on Aldis Hill, St. Albans, the last two were

found, growing with the only plant of *Asplenium angustifolium* I have ever met with. *Asplenium acrostichoides*, which seems to be not common in northern Vermont, also grew with the last three species and was found once at Williston. Among the limestone lovers I was pleased to find *Camptosorus rhizophyllus* and *Pellaea atropurpurea* var. *Bushii* Mackenzie at Ethen Allen Park, Burlington. *P. atropurpurea* var. *Bushii*, not before recorded from Vermont, but collected probably by Faxon at Burlington many years ago, should be looked for elsewhere in the state. It differs in its very smooth stipes and rachis from the chaffy-hairy typical forms. *Camptosorus* was seen on two or three occasions afterward both in the Burlington region and at Swanton, and true *P. atropurpurea*, with the other calciphiles, *Cystopteris bulbifera* and the pretty little wall-rue (*Asplenium Ruta-muraria*), was collected on the limestone ledges at Winooski forge. The three oak-ferns—*Phegopteris Dryopteris*, *P. hexagonoptera*, and *P. polypodioides*—were found at or near Essex Junction, but only *P. polypodioides* at Swanton, where the rich woods favored by these species are less common.

In Rhodora, for September, 1913 (XV. 154-156), a synopsis was given of the seven forms of the cinnamon fern which seem worthy of distinction, the substance of which may be repeated here. Typical *O. cinnamomea*, with rounded or subcutish entire pinnules, crowded or subremote, ranges from Newfoundland to Florida, west to Illinois and Louisiana, or probably further. It includes forma *angusta* Clute, which at least as to the only authentic specimen seen seems a mere state with somewhat revolute pinnules, not worthy of separation. I have not infrequently found a similar state in swampy spots where the trees had recently been felled. Var. *glandulosa* Waters, which was retained as a variety rather than a forma out of deference to its some-

what stronger characters and apparently definite, although limited range, has the pinnules, which are likewise entire, glandular-pubescent, as well as the upper part of the rachis. The next four forms have some or all of the pinnules toothed, lobed or crenulate, and are usually best developed in deep, rich, shady woods. Forma *incisa* (Huntington) Gilbert has many of the pinnules particularly towards the middle of the pinnae sharply toothed and when extreme is the handsomest form of the species. Included in this is var. *auriculata* Hopkins, a plant which in its often greatly enlarged basal pinnules, shows an approach to the next form, but which on account of their acute dentations seems better referred here. Forma *bipinnatifida* Clute, of which f. *trifolia* Clute is merely a lesser development, has bluntly lobed pinnules, with the lobing most conspicuous toward the base of the pinnae, the lowest pinnules being often much elongated. The new forma *latipinnula* Blake has very thin oblong or almost deltoid pinnules, 1 cm. wide, 1.5–2 cm. long, with crenulate or slightly lobulate margin. The type comes from Stoughton, Massachusetts, and I have seen it also from Walpole, and from Swanton, Vermont. The peculiar forma *cornucopia-folia* Clute, described and figured in Fern Bulletin XVI. 108–109 (1908), has the costa of the pinnae naked for some distance near the tip, and many of the pinnules, some of which are lobed, bear ascidia on naked veinlets from the under surface. Finally the well-known forma *frondosa* (Torr. & Gray) Britton, generally quoted as var. *frondosa* Gray, has the fruiting pinnae partly foliaceous. During 1912, I found an abundance of this form in the vicinity of Stoughton, and while it was often met with in burnt-over ground, quite as often it occurred in meadows or pastures where there was no evidence of recent fires. On one occasion, in 1908, I found the same form in a white cedar swamp in Canton, where also no obvious cause for this deviation was evident.

Of these forms, *O. cinnamomea* (typical) is common in Vermont; f. *incisa* I have seen from several station; f. *bipinnatifida*, which I collected in a pasture in Williston seems to be new to the state; f. *latipinnula* is so far known only from Swanton; and f. *frondosa* from a few stations in Vermont.

A peculiar form of *O. regalis*, f. *interrupta* Milde, with fronds fertile in the middle was collected at Swanton on one occasion. It seems to be due to second growth after the first fronds have been destroyed by mowing.

Of the grape-ferns, *Botrychium obliquum*, with a form approaching var. *dissectum*, *B. ternatum* var. *intermedium*, and *B. virginianum* were collected, and a colony of the adders-tongue with many of the fronds paired from the rootstocks was found in a pasture at Essex Junction.

Equisetum arvense, *E. fluviatile*, *E. hyemale* var. *affine*, and *E. sylvaticum* were common everywhere, and *E. scirpoides* uncommon. The scarce species, *E. palustre*, was twice collected in Colchester, and *E. hyemale* var. *affine* forma *polystachyum* Prager, a form with many sessile spikes from the upper nodes, was found once in sandy soil at Burlington. *E. variegatum* var. *Jesupi*, a very handsome plant as it grew in tufts among the rocks along the Winooski, with its trim black-and-white-and-green-striped spikes, then in young fruit, was found somewhat abundantly along the shores of the Winooski River at Essex Junction, and sparingly in Burlington and South Burlington. Among the thousands of individuals along the shores of the Winooski occurred two variant forms, one of which, with one or two supernumerary spikes from the topmost nodes, I have described as f. *geminatum*, while the other, whose fertile stems bear from two to eight long many-jointed branches, often fruitful at the tips, I have called forma *multirameum*.

Among lycopods *L. clavatum*, *L. complanatum* var. *flabelliforme*, *L. inundatum*, *L. lucidulum*, and *L. obscurum* with its var. *dendroideum* occurred at both localities. *L. clavatum* var. *megastachyon* was found at Essex and on Mt. Mansfield, *L. tristachyum* at Burlington and Fairfield, and *L. Selago* at 3950 feet on Mt. Mansfield. The only selaginella of the region is *S. rupestris*, which was collected at Cobbehill, Milton, and at Prospect Hill, St. Albans, where it formed large mats on exposed ledges at 800 feet.

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Fern nomenclature

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From the point of view of the English Fern students, the fern nomenclature adopted in the AMERICAN FERN JOURNAL affords ample evidence of the terrible haste which the scientific botanists have made in the course of their research regarding the original names given by the older botanists with the result of resurrections thereof (i. e. of the names, not the botanists), and the increased puzzlement of the fernists of the present day due to the changes involved. In many cases this involves a sort of translation from one language into another which between otherwise English-speaking nations is an absurdity. I, for instance, am familiar with certain common ferns, which are popularly called buckler ferns and scientifically here *Lastrea*, or better still, *Nephrodium*, this latter name indicating the kidney-shaped form of the indusium, which the word buckler, as distinct from shield, does also to an accepted extent. In the States, however, instead of these I find frequent mention of *Dryopteris* as the accepted synonym, which merely means oak fern, an obvious absurdity, as